POST-TERTIARY FORAMINIFERA FROM A BORE NEAR ROSEBUD, VICTORIA

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The material examined and reported upon in this paper was collected by Mr. R. A. Keble, now Palaeontologist of the National Museum of Victoria, during his survey of the Mornington Peninsula, when an officer of the Geological Survey, and is from Mines Department Bore No. 5, parish of Wannaeue, 177-187 feet. The location of the bore is approximately 4 miles from Rosebud, on the road to Flinders. The greater part of the sample consisted of fine grey sand, which passed through a sieve of 60 meshes to the inch. The balance was almost wholly organic in origin, being made up of bryozoa, foraminifera, ostracoda, and molluscan remains, all being so broken up or small as with a few exceptions to pass through a sieve of 40 meshes to the inch.

The following species of foraminifera, which are considered to be indigenous to the deposit, were met with:

1. Textularia sagittula Defrance rare
2. Clavulina multicalmerata Chapman rare
3. Planispirina bucculenta (Brady) rare
4. Nubecularia lucifuga Defrance rare
5. Quinqueloculina sp. cf. lamarchiana d'Orbigny very rare
6. Q. subpolygona Parr common
7. Q. costata d'Orbigny common
8. Q. seminulum (Linne) rare
9. Q. vulgaris d'Orbigny rare
10. Spiroloculina antillarum d'Orbigny very rare
11. S. milletti Wiesner frequent
12. Triloculina trigonula (Lamarck) rare
13. T. striato-trigonula Parker and Jones frequent
14. T. circularis Bornemann rare
15. *T. sp. aff. sublineata* (Brady) frequent
16. *Pyrgo denticulata* (Brady) rare
17. *Peneroplis planatus* (Fichtel and Moll) rare
18. *Spirillina denticulata* Brady frequent
19. *S. limbata* Brady very rare
20. *S. inaequalis* Brady common
21. *Lenticulina sp.* very rare
22. *Planularia patens* (Brady) very rare
23. *Vaginulina vertebralis* Parr rare
24. *V. bassensis* Parr rare
25. *Dentalina mutsui* Hada frequent
26. *Lagena perlucida* (Montagu) rare
27. *L. sulcata* (Walker and Jacob) common
29. *L. distoma-margaritifera* Parker and Jones frequent
30. *L. distoma-margaritifera*, var. *victoriensis* Parr frequent
31. *Fissurina contusa* Parr rare
32. *F. orbignyana* Seguenza var. rare
33. *Entosolenia williamsoni* Alcock very rare
34. *E. squamosa* (Montagu) frequent
35. *E. variata* (Brady) frequent
36. *Gutulina regina* (Brady, Parker and Jones) common
37. *Globulina gibba* d'Orbigny, var. *globosa* (Münster) frequent
38. *Sigmoidella elegantissima* (Parker and Jones) rare
39. *Bolivinella folium* (Parker and Jones) frequent
40. *Buliminella elegantissima* (d'Orbigny) rare
41. *Buliminoïdes williamsonianus* (Brady) very rare
42. *Bulimina marginata* d'Orbigny (short form) very rare
43. *Bolivina pseudoplicata* Heron-Allen and Earland rare
44. *B. rugosa*, sp. nov. common
45. *B. sp. nov.* very rare
46. *Rectobolivina digitata* Parr common
47. *Reussella armata* (Parr) very rare
48. *Pavonina flabelliformis* d'Orbigny very rare
49. *Uvigerina sp. aff. pigmea* d'Orbigny very common
50. *Angulogerina carinata* Cushman, var. *bradyana* Cushman rare
51. *Patellinella inconspicua* (Brady) rare
52. *Discorbis dimidiatus* (Jones and Parker) common
53. *Discorbis australis* Parr common
54. *D. australensis* Heron-Allen and Earland common
55. *D. opercularis* (d'Orbigny) common
56. *D. williamsoni* Chapman and Parr frequent
57. *D. pulvinatus* (Brady) very rare
58. *Discorbinella biconcava* (Jones and Parker) frequent
59. *D. disparilis* (Heron-Allen and Earland) rare
60. *D. involuta* (Sidebottom) very rare
61. *Notorotalia clathrata* (Brady) common
62. *Streblus beccarii* (Linne) frequent
63. *Anomalina nonionoides* Parr very rare
64. *A. wüllerstorfii* Schwager very rare
65. *Cibicides lobatulus* (Walker and Jacob) rare and small, some showing *Dyocibicides* plan of growth

66. *Planorbulina mediterranensis* d'Orbigny very rare
67. *Acerulina inhaerens* Schultze frequent
68. *Gypsina vesicularis* (Parker and Jones) rare, hemispherical specimens

69. *Globigerina bulloides* d'Orbigny common, small
70. *G. inflata* d'Orbigny common, small
71. *Orbulina universa* d'Orbigny frequent, small
72. *Globorotalia pseudocrassa* Chapman and Parr frequent, small
73. *Elphidium argenteum* Parr very rare
74. *E. advenum* (Cushman) rare
75. *E. verriculatum* (Brady) rare
76. *E. macellum* (Fichtel and Moll) frequent
77. *E. crispum* (Linné) common
78. *E. sp. aff. minimum* (Seguenza) common
This list of foraminifera may be compared with that given in a paper by the author (Parr, 1945). It will be seen that practically all of the species also occur in the shore sands of Barwon Heads. The remainder, with the exception of *Pavonina flabelliformis*, have been met with by the writer in other Victorian shore sands or in dredgings from Bass Strait. *P. flabelliformis* is typically a Recent Indo-Pacific species, although it occurs in the Pliocene of the Hamilton district, in western Victoria.

The following new species is described from the material:

**Bolivina rugosa, sp. nov.**

Text-figs. *a, b.*

Test comparatively small, from two and a half to three times as long as broad, only slightly compressed, rather regularly tapering throughout, with the margins lobulated, generally excavated along the median line, periphery broadly rounded, basal end blunt or pointed with a slight spine; chambers distinct in the latter stages, numbering from 12 to 14 in the adult, in the early portion broader than high, later with the height and width about equal, later chambers strongly inflated; sutures distinct, oblique, deeply depressed in the later chambers; wall coarsely perforate, the surface of all chambers except the terminal half of the last thickened and rough, often with a ridge around the base of the early chambers and developing longitudinal lines of coarse beads on the later chambers; aperture elongate, with a pronounced lip, generally with the base removed a little from the inner margin.

Length, 0.6 mm.; breadth, 0.22 mm.; thickness, 0.14 mm.

Examples of this species are common. It shows some resemblance to *B. parri* Cushman, from the Pliocene (Castlecliffian) of Castlecliff, Wanganui, New Zealand, but differs in its deeply depressed sutures and much greater amount of ornamentation.

The holotype of *Bolivina rugosa* and examples of the other species recorded are being deposited in the National Museum of Victoria.

Associated with the Post-tertiary foraminifera are some species
which are undoubtedly derived from Tertiary deposits. They do not differ in preservation from the later forms but, in a long experience of Victorian fossil and living foraminifera, the writer has found them to occur only in the Tertiary. Fossil foraminifera, derived from nearby Tertiary deposits, were, it may be recalled, also associated with the Recent species in the shore sands at Barwon Heads.

The Tertiary foraminifera include a number of undescribed species, but the following may be mentioned with the known range of each:

- **Cornuspira crassisepta** Brady
- **Fissurina** sp. aff. globosa Bornemann
- **Ehrenbergina** sp. aff. mestayeri Cushman
- **Discorbis margaritiferus** (Heron-Allen and Earland)
- **D.** sp. nov. (of bertheloti group)
- **Eponides** sp. nov.
- **Heronallenia** sp. nov.
- **Ceratobulimina hauerii** (d’Orbigny), var. australis Cushman and Harris
- **Siphonina australis** Cushman
- **Anomalina** sp. aff. rotula d’Orbigny
- **Planorbulinella inaequilateralis** (Heron-Allen and Earland)
- **P. plana** (Heron-Allen and Earland),
- **Sherbornina** sp. ? nov.
- **Annulopatellina** sp. nov.

The genus *Sherbornina* is known only from one described species, *S. atkinsoni* Chapman, which occurs at Table Cape, Tasmania, and is also found in the Janjukian of Victoria. The present species appears to represent a new form. It is thicker than *S. atkinsoni*, and also has the centre of the upper surface more depressed. The species of *Annulopatellina* is also new, and is identical with a species which occurs in the clays intercalated between the limestones in the lower part of the section at Castle Cove, west of Cape Otway. This is low down in the Janjukian.

The source of these derived foraminifera remains to be considered. Tertiary deposits of Balcombian age now occur in the
sea floor at Balcombe Bay, Mornington, and between Point Lonsdale and Barwon Heads. The nearest Janjukian deposits are on the coast in the vicinity of Torquay. It appears probable that the foraminifera were washed out of these deposits or some unknown nearer deposits and carried along a tidal channel to the position in which they were found.

References